Appln No. 10/092,846 Amdt date February 27, 2004 Reply to Office action of September 30, 2003

Amendments to the Abstract:

On page 38, line 1 through page 39, line 12, please replace the Abstract with the following:

ABSTRACT OF THE DISCLOSURE

A polymer for a chemically amplified negative photoresist and a photoresist composition

are provided. A representative polymer of the invention is a compound of formula 5:

$$\frac{\left(\left(CH_{2}-\stackrel{R_{1}}{C}\right)_{a}-\left(CH_{2}-\stackrel{R_{1}}{C}\right)_{b}-\left(CH_{2}-\stackrel{R_{1}}{C}\right)_{c}-\left(CH_{2}-\stackrel{R_{1}}{C}\right)_{d}\right)_{n}}{\left(CH_{2}-\stackrel{R_{1}}{C}\right)_{b}-\left(CH_{2}-\stackrel{R_{1}}{C}\right)_{c}-\left(CH_{2}-\stackrel{R_{1}}{C}\right)_{d}\right)_{n}}{\left(CH_{2}-\stackrel{R_{1}}{C}\right)_{b}-\left(CH_{2}-\stackrel{R_{1}}{C}\right)_{d}\right)_{n}}$$

$$\stackrel{R_{2}}{\underset{R_{3}}{\underset{R_{5}}{|R_{4}|}}}$$

$$\stackrel{R_{4}}{\underset{R_{5}}{|R_{15}|}}$$

$$\stackrel{R_{14}}{\underset{R_{15}}{|R_{15}|}}$$

$$\stackrel{R_{16}}{\underset{R_{17}}{|R_{17}|}}$$
(5)

wherein:

R₁ is H or CH₃;

 R_2 and R_4 are each independently $(R)_{\alpha}(CH_2)_{\beta}R'$ or $(R)_{\alpha}[(CH_2)_{\gamma}O]_{\delta}R'$ (wherein, R is CO, CO_2 , O, OCO, or OCO_2 , R' is O, CO_2 , or OCO_2 , CO_2 , or CO_2

----R₃ is represented by one of the formula:

$$\begin{array}{c|c}
R_7 & R_7 \\
\hline
-R_6 & OR_8 \\
\hline
OR_8 & R_{10} \\
\hline
\end{array}$$

$$\begin{array}{c|c}
R_7 & -R_6 & OR_{11} \\
\hline
R_{11} & R_{12} \\
\hline
\end{array}$$

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from H, C_1 - C_5 -saturated alkyls, C_1 - C_5 -ethers, C_1 - C_5 -earbonyl groups, and C_1 - C_5 -alcohol-groups; and m is a number ranging from 1-5; and

R₅ is represented by formula:

wherein R₁₂ and R₁₃ are each independently H or OH; and

* represents the bonding site at which the R₄ group is bonded.

 R_{14} and R_{16} are each independently selected from a single bond $(R)_{\alpha}(CH_2)_{\beta}R'$ and $(R)_{\alpha}[(CH_2)_{\gamma}O]_{\delta}R'$ (wherein, R is CO, CO₂, O, OCO, or OCO₂, R' is O, CO₂, or OCO₂, α is 0 or 1, β is 0 to 5, γ is 1 or 2, and δ is 1 to 5); R_{15} is a hydroxyl group; R_{17} is a carboxyl group;

R₁ through R₅ and R₁₄ through R₁₇ are defined as set forth in the specification, and a, b, c, and d represent the mole ratios of each monomer, wherein a has a value of 0-0.5, b has a value of 0-0.9, c has a value of 0-0.3, and d has a value of 0-0.3, provided that a+b+c+d = 1; and

———n represents the degree of polymerization of each polymer, and has a value of at least 2.

ABSTRACT OF THE DISCLOSURE

A polymer for a chemically amplified negative photoresist and a photoresist composition are provided. A representative polymer of the invention is a compound of formula 5:

$$\frac{\text{(CH}_{2}-\overset{R_{1}}{C})_{a}}{\text{(CH}_{2}-\overset{R_{1}}{C})_{b}} \quad \text{(CH}_{2}-\overset{R_{1}}{C})_{c}}{\text{(CH}_{2}-\overset{R_{1}}{C})_{c}} \quad \text{(CH}_{2}-\overset{R_{1}}{C})_{d})_{n}}$$

$$\overset{R_{2}}{\underset{R_{3}}{\text{R}_{4}}} \quad \overset{R_{4}}{\underset{R_{5}}{\text{I}_{5}}} \quad \overset{R_{14}}{\underset{R_{15}}{\text{R}_{16}}} \quad \overset{R_{16}}{\underset{R_{17}}{\text{R}_{17}}}$$
(5)

wherein: R_1 through R_5 and R_{14} through R_{17} are defined as set forth in the specification, and a, b, c, and d represent the mole ratios of each monomer, wherein a has a value of 0-0.5, b has a value of 0-0.9, c has a value of 0-0.3, and d has a value of 0-0.3, provided that a+b+c+d = 1; and n represents the degree of polymerization of each polymer, and has a value of at least 2.

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